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ABSTRACT

The detailed study deals with the two basic types of computer-assisted placement mechanisms now operating as components of the United State Employment Service (USTES). Job banks receive job orders, organize, edit, and display; job-matching systems perform similar functions but in addition attempt to screen and match jobs and job applicants. The first section of the document focuses on a comparison of the characteristics, strengths and weaknesses, and current status of the two concepts. Activity and cost data for several job banks and job-matching systems are surveyed, with supporting data, with reference to placement speed, speed of placement by occupational groups, wage distribution of employment service placements, job bank and the unemployment rate, and cost analysis and cost comparisons. A detailed discussion of critical issues pertaining to computer-assisted placement as a component within the USTES is followed by a survey of the current state of the art, relating to technology, funding, the absence of an adequate descriptor system, psychological reactions to computerization, and problems relating to programing. The document concludes with a discussion of five recommendations. (SA)

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COMPUTER-ASSISTED PLACEMENT SYSTEM

WILLIS J. NORDLUND

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1973

PREFACE

This study was begun under Grant 91-47-69-64, from the Office of Research and Development of the Manpower Administrator, U.S. Department of Labor, and completed under a fellowship from funds provided to the Human Resources Institute, University of Utah under an institutional grant from the Office of Research and Development. The complete responsibility for the findings and conclusions, of course, rest with the author.

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Chapter I

INTRODUCTION

The United States Employment Service (USTES) has been searching for some method of providing comprehensive service to the American public since its creation by the Wagner-Peyser Act of 1933. Traditionally, it operated as a labor exchange mechanism with primary service provided to employers and peripheral service given to applicants. In loose labor markets, its task was very difficult; in tight labor markets it was relatively easy. In other words, when jobs were plentiful, but applicants were scarce, it was difficult to provide suitable workers. Similarly, when jobs were relatively scarce and workers were plentiful, the USTES could supply an adequate number of workers to employers. What was apparently needed was a reorientation of the USTES away from employers and toward applicants. This shift began in the early 1960's when the USTES absorbed the responsibility of administering several major manpower programs. The emphasis continued changing throughout the 1960's until there was virtually an employer revolt in 1969 and 1970. What became most objectionable to employers was not the shift from employer to applicant emphasis, but the shift to "disadvantaged" or HRD (Human Resource Development) applicants.

A major lesson has been learned. There are two sides to the labor market, each with its unique needs and desires. The USTES, or any other employment agency for that matter, must serve both sides if it is to be successful. In addition, it must be the type of service that appeals to the full spectrum of clients on both sides. If only low skilled, relatively undesirable job openings are given to the USTES, the applicants looking for higher level jobs will be alienated. Similarly, if the USTES will only refer or give strong preference to HRD referrals, many employers will gravitate away from this service.

This lesson, which should have been obvious, was learned in a painful and probably detrimental way by the USTES. Efforts are being made to restore the employer and applicant clients that were lost in the middle and late 1960's. It will be an uphill struggle because of the rapid influx of private competitors and because of the skepticism many clients hold toward this public agency. Many now feel that their fears were borne out by the activities in recent

years and it will require a considerable conditioning period to regain their confidence. Some improvement in the statistics will arise because of the current legislation requiring federal contractors to list job openings with the USTES. However, this will be short-lived and it is not the type of "cooperation" the USTES needs for achievement of their long run goals. They must begin the process of developing confidence in both client groups by providing high quality and rapid service.

For the last half decade a device has been under development that can potentially assist in providing the required type of service. This study will examine this device in historical perspective, current status, and future implications. It is a highly complex and expensive system. There are high hopes that it will develop in such a manner as to change the image of the USTES and allow it to become a significant contributor to labor market adjustment and thus allow the extra cost of the system to be justified. Preliminary indications are that changes have occurred and will continue to occur, but whether or not it will become an effective mechanism is strongly debated. The general term for these systems is "computer-assisted placement mechanisms" and they are dichotomized into two basic categories--job banks and computerized job-matching systems. Each system is unique in terms of operation, but both have a common objective: provide <u>all</u> clients with comprehensive, rapid, and unbiased service. Each has many additional goals and objectives as well, but these will be left for later discussion.

The material is organized in the following manner. Chapter II outlines the two major concepts with a brief overview of each system. A preliminary examination of the current status of the two concepts follows this discussion. Chapter III analyzes the basic conceptual strengths and weaknesses of the systems. Following this analysis is operational data and cost comparisons pertaining to the systems.

Chapter IV presents a number of critical issues concerning computer-assisted placement. A similar discussion outlines some of the more general issues involving the Employment Service as an operating entity. Based on this discussion, the direction of actual and needed change is outlined. Chapter V provides an overview of the current state of the act followed by a summary statement and a series of recommendations.

It might be noted at this point that the concept and systems under consideration are very complex. They are automated systems that produce a vast array of data applicable to their operation. [Raw data may be obtained by contacting the Human Resources Institute, University of Utah or the author.]

Chapter II

COMPUTER-ASSISTED PLACEMENT: TWO MAJOR CONCEPTS

In 1961, the Bureau of Employment Security (BES) established two pioneering systems that were to utilize computers in the operation of day-to-day local office operations. The systems were called Labor Inventory Communications Systems (LINCS) and one was established on each coast. They were appropriately called LINCS–East and LINCS–West. Unfortunately, interest, money, and expertise were inadequate to sustain these systems. LINCS–East (connecting New York City, Baltimore, and Washington, D.C.) floundered immediately and never successfully provided any service to the participating cities. LINCS–West (connecting Utah, California, Texas, and Arizona) managed to make some headway in the sense of remaining viable. These systems were little more than interstate clearance mechanisms and they proved more expensive and time consuming than the original manual system. Therefore, Utah, Texas and Arizona withdrew from the LINCS–West experiment after two years. However, California refused to let LINCS–West dissolve. They established an internal clearance network and thereby maintained and developed a cadre of computer experts. These individuals became the nucleus upon which the "new" LINCS was built in the late 1960's.

The frustrations of the two LINCS projects resulted in a temporary lapse in development of a computerized placement system. The BES initiated a number of task forces to study what had happened and to give new direction to developmental activity. The Sloan School of Management at the Massachusetts Institute of Technology hosted a national conference on computer-assisted placement systems in both the public and private sectors. The Interstate Conference of Employment Security Agencies (ICESA) convened several ad hoc committees to study the problem and set forth recommendations. As a consequence of activities of this type, the BES decided to approach the problem with renewed effort. Most individuals involved felt that computer-assisted placement could become feasible both technologically and operationally. A significant number of experiments in the private sector had shown modest success and national administrators began the arduous task of setting up a public system.

At the outset it was recognized that the complexity of the task would or could overwhelm the capability of any one state. Therefore, it was decided that the computerization effort would be divided up and given to several states. Also, the BES wanted as much state involvement as possible because of the tacit recognition that the federal administration did not possess the expertise to do the whole job. The task was divided into three components: 1) an automated cost accounting system, 2) the job-matching component, and 3) the Local Office On-line Payments System (LOOPS) for Unemployment Insurance and a migrant labor clearance system.

In that the resulting systems were to have national applicability, it was felt that states of all sizes should be represented. Florida, a medium sized state, was selected to develop the automated cost accounting system. Utah, a small state, was given the assignment of developing the computerized job-matching system. Michigan, a large state, was assigned the task of developing the LOOPS and migrant worker clearance systems. Each of these states were designated "model states" for purposes of the total effort. The implicit assumption was that these states would be the models upon which other states could pattern their systems. There was considerable optimism flowing throughout the federal and state administrations concerning the feasibility of exporting the various systems to other states. Dates were set for exportation, and deadlines for final completion and testing of the systems were established.

Since this study deals with only the job-matching component, only cursory review of the other two segments is needed. Florida was unable to develop an operational cost accounting system because of the lack of interest by the state administration. This effort floundered and Florida was withdrawn as a model state. Michigan did produce an operational migrant farm labor clearance mechanism. However, the LOOPS failed to reach an effective operational level and subsequently stagnated. Much was learned in both experiments and of most importance was the realization that full support of federal and state administrators is needed and that the tasks are extremely complex.

The model state assignments were made in early 1967. In 1968, Wisconsin entered the development arena with a somewhat new approach to the matching concept. Concurrently, California

began a renewed effort to revive the LINCS with an expanded descriptor system. In 1969, New York initiated a fourth matching concept. The development progressed on each system with continued federal pressure to produce an operational system suitable for export. Enthusiasm ran high, but persistent developmental problems plagued the total effort. Indecision about the appropriate descriptor system and search strategy complicated the decision-making process. Some liked Utah's DOT system while others favored a key word concept. A final selection was needed, but too many unanswered questions remained for a final decision.

In 1968, the Baltimore Employment Service devised a seemingly innocent and relatively simple device for keeping track of job orders. Under heavy pressure from local businessmen to reduce the number of public agencies soliciting job orders, the Baltimore Employment Service developed the job bank. This system was essentially an automated job order file in which all new job orders were entered and filled or cancelled orders were eliminated. It was an open and complete file for all participating public agencies to use. It included all job orders submitted to public agencies and it was up to date. Everyone had equal access to the job bank book and it reduced the mass duplication of effort in the job order solicitation process.

The job bank concept immediately caught the eye of federal and state administrators. It was found appealing for several reasons: 1) it was relatively inexpensive because of the possibility of time-sharing, batch processing, and only limited computer usage; 2) it could be installed relatively quickly (three to four months); 3) it apparently caused minimal internal disruption; and, 4) mayors and governors needed "something" to show their constituents.

Preliminary indications showed that the job bank could have a significant impact on local office placement activity. The matching systems were hard pressed to come up with similar results. In addition, it was recognized that the matching concept was more complicated than initially assumed and that exportation was not feasible. Therefore, the USTES began the rapid expansion of job banks throughout the country. There was only one job bank in 1968. Eight were started in 1969. Fifty were installed in 1970 and 47 became operational in 1971. Three became "state-wide" systems, two were designated "county" systems, and Washington

obtained a "rural" job bank. In total there are 106 job banks and four job matching systems in operation. This is about as many as the Manpower Administration felt were needed and future expansion will be very slow.

The Characteristics of Job-Matching and the Job Bank Concept

There are many operational differences in the two concepts, but two primary differences exist. First, the job-matching system attempts to assign characteristics or attributes to the applicant and job order and then obtain as close a "match" as possible. The job bank does not attempt to make an initial screening. Second, the job bank simply organizes incoming job orders, eliminates filled or cancelled orders, and produces a document each day with the unfilled orders displayed in a prescribed format. Three methods of display are currently used, i.e., a job bank book, microfilm, and microfiche. The matching systems organize job orders and applicant records and have the capability of selecting one or more in response to a query.

These two attributes immediately point out the vast difference in the complexity of the two concepts. One simply receives, organizes, edits, and displays. The other performs similar functions, but in addition attempts to screen the respective files against one another to obtain a preliminary match. The latter function involves the descriptor system and search strategy components and is the aspect of the systems that has come under heavy criticism. Job-matching quickly moves beyond the relatively simple task of building files and into the realm of file manipulation. As each of the four matching systems and the job bank network is described in more operational detail, the inherent complexity of the matching systems will become apparent.

Before beginning the individual descriptions of the systems, it seems important to point out a number of additional conceptual and operational differences between the two concepts. It must be remembered, of course, that the four matching systems are not identical conceptually or operationally. However, their similarities far outweigh their differences, particularly when compared to the job bank system.

The first difference concerns the method of access utilized by the computer-assisted system. In other words, how can system

users gain access to or utilize information in the data bank? There are two methods, i.e., on-line access and off-line access. The former permits the internal users to submit queries to the data bank on an instant input-instant output basis. They are able to gain access to the respective files on a real-time basis by utilizing a remote terminal located in the local office. Off-line access, frequently called "batch processing," is simply a method of computer usage that utilizes standard programs to process large amounts of data that has been accumulated or "batched" during the working day. At a specified time, all of this data is processed and the required output is obtained. The internal users do not have direct access to this information except at specified time intervals (after each batch run).

The significance of file access may not be readily apparent. A more in depth explanation of how it is used will make the difference clear. The job banks and one matching system (LINCS) rely upon the batch processing method of file access. Job banks generally use one access each day, the LINCS system uses several. There is a significant difference in how each uses it also, but this must wait for the subsequent discussion.

In effect, job orders flow into the central order-taking unit of the job bank throughout the course of the work day. They are edited, verified, and coded. Simultaneously, local office placement interviewers are filling and cancelling job orders that were in the system from the previous day. There are also cases in which errors are corrected or other changes made in the existing job orders. All of this input is accumulated and key punched. No action is taken on it during regular business hours. Rather, it is typically sent to a computer facility outside the job bank area for processing. The computer center processes the "batch" of data and provides the required output documents. These are distributed to the prescribed cooperating users and will become the basic information source for the next day's operation. Each internal user has a complete, updated, accurate listing of all job orders that have been submitted to the job bank.

LINCS operates in the batch mode, but it is different than job bank activities in several ways. First, LINCS uses the batch mode several times each day. They have specified a six-hour turnaround time (time required between initial input and subsequent output) that permits them to give same day service to their clients.

Second, the computer data base consists of both an applicant file and a job order file. Job banks have only the latter. Third, LINCS attempts to match the characteristics of each file against the other. The output from this process is a listing of suitable jobs for an applicant or a list of applicants potentially referrable to a specific job order. In addition, LINCS updates their files in response to change notices resulting from placements, cancelled orders, errors, etc.

Actually, all systems at least partially, use the batch mode, but there are significant differences in how they utilize the computer. This process is relatively inexpensive, slow, and highly structured. For example, Utah's Computerized Job-Matching System (CJM) uses the batch mode to update their files when the number to select is very large, to facilitate their "complex search," etc. The batch process is used generally when it is not necessary to give instant response to a user's query.

The batch process is one way of doing the job, but it has obvious shortcomings. The most significant limitation is that it generally requires the client to make more than one contact with the local office. The USTES has attempted to make the placement process function in such a way as to provide one-stop service to its clients. In other words, on the first local office contact the client would be provided with as much information as is currently available. The employer would know what applicants were available and the applicant would know what jobs were available. If additional assistance was needed, i.e., counseling, training, testing, etc., more than one contact may be necessary. However, for the job-ready applicant and the employer with a current job opening, a primary goal was to provide instant and complete service.

This is where the second mode of access enters the picture. The remaining three matching systems have the capability of searching the appropriate file on behalf of a client when the client is in the local office or is on the telephone. The applicant's characteristics or the job order requirements are taken on the initial contact. These elements are fed directly into the central processor via a remote terminal in the local office. An on-line search is made as requested and the results of that search are instantly transmitted back to the interviewer. The interviewer can then respond to the client in the appropriate manner. The entire process may take several seconds or at most several minutes.

This salient feature greatly increases the complexity of the operation, requires continued access to a central processor, and requires a relatively large data storage mechanism. Whether or not on-line matching is a necessary feature of a successful system is not clear. It may be necessary for certain types of applicants and particular types of jobs. But, as LINCS appears to demonstrate, a functional matching operation can exist without on-line access. This issue will be discussed again in Chapter 4.

A second fundamental difference between the two concepts was alluded to previously. In the job-matching process, a descriptor system and search strategy are needed. The job bank only requires an organization scheme. The matching systems must go beyond the task of organizing their files and address questions such as: "How should applicants and job orders be described? " "Should they use the DOT code, key words, a weighting scheme, build characteristic profiles, etc.? " Equally as complex and controversial, "How should they go about searching for particular job orders or applicants? " "Who should get preference, how should ties be broken, how long should a record remain in the active file, etc.? " As will be seen later, the matching systems are deeply concerned with these questions and to date there is little agreement on the proper combination.

A third difference involves the complexity of the physical hardware and programming needed for successful operation. A matching system can exist without an in-house computer, but as the New York Area Manpower Data System has demonstrated, a number of coordination problems are likely to arise. It is generally felt that the matching systems should have full time access to a central processor and all of the peripheral hardware. On the other hand, the job banks can exist easily on a time-sharing arrangement. In fact, it would be a gross waste of computer facilities to restrict its use to producing only the output needed in the job bank operation. Most job banks only require two or three hours of computer time each day. This would scarcely be enough to justify an in-house system.

As should be obvious, the number and complexity of computer programs is much greater in the matching systems. The myriad problems encountered in developing the four matching systems clearly demonstrates the programming and systems analysis complexities. Job bank programs are relatively simple and

have been standardized in the E. F. Shelly Corporation's plan entitled *USTES Standardized Job Bank System.*

These are the principal differences in the two basic concepts. There are also many differences between the matching systems particularly in terms of internal operation. While these differences are extremely important, the basic conceptual similarities should be carefully noted.

Strengths and Weaknesses of the Two Concepts

The two basic concepts have a common basis for existing, i.e., to facilitate the placement process. However, each attempts to accomplish its objectives in different ways. With the outline of system characteristics in the previous section, it can easily be seen that the scope of activity and the intensity of involvement is vastly different. These factors lead to the identification of the strengths and weaknesses of the two concepts.

Looking at the job bank first, its single most prominent strength is simplicity. This attribute exists both conceptually and operationally. Some of the specific automated processes may be relatively complex, but from the standpoint of internal and external users it is very simple. On the other hand, one of the most frustrating characteristics of the matching systems has been their complexity. The primary reason for the added complexity is that the computer is actually being used in the internal placement process. In other words, it is becoming an integral part of the mechanics of placement. The basic concept of matching is not particularly overwhelming, but the operational features of the system tax internal personnel from the highest administrative level to the local office interviewer's desk. In a sense, the computer monitors, evaluates, and responds to everything that impinges on the system. Therefore, everyone must have a working knowledge of what happens internally in response to a particular activity. In other words, they must understand what the system will accept and reject, how it will respond to queries, and what it can be expected to do. Under the job bank, there is virtually no direct contact with the computer.

Second, while much can be said for simplicity, the problem under attack is very complex. If all that is wanted is some device

to provide a central storage and delivery of information function, the job bank type system may be adequate. However, if the data must be processed or manipulated in varying ways depending on the needs of the client, the job bank is not enough. Input, organization, and output of data is a simple process. Retaining this data in the system and subjecting it to various types of queries is a vastly more complex process.

This, of course, is the basic strength of the matching systems. They provide not only a data bank but also are capable of searching that information for a particular type of client or job opportunity. This requires the development of complex file organization and the requisite search routines. It also necessitates the development of descriptor elements in addition to the basic organization format.

Third, the matching systems permit instantaneous and repeated use of all internal data elements. The records can be changed immediately in response to observed errors, additional information, or the results of some activity, i.e., referral, placement, etc. The job bank utilizes a central control unit to control the status of open job orders, but changes must wait for the daily update and reorganization run. This is not to say however that all of the matching systems use on-line updating. On the contrary, they have the capability (LINCS does not), but they may or may not use it. Only Wisconsin's ESOPS uses it on a continual basis.

A fourth strength or advantage the matching systems possess or can possess is the capability of monitoring the progress job orders or clients make in the system. In other words, if a particular sequence of activities is not performed within a specified time interval, a notice will be generated and sent to the appropriate person. A couple of examples will clarify the issue. If, for example, an applicant in the Utah system has been selected three times by the computer, but not referred, it may indicate that something is wrong. The system apparently likes him, but the placement interviewer does not. Some additional counseling, recoding, training, etc., may be needed before the client will be job ready. Under the manual system the client could have been stranded in the system for long periods without receiving service.

A similar device is used to alert interviewers in the LINCS system when employers fail to return a validation form. This permits the interviewer to contact the employer and ascertain the status of the order and the disposition of the referrals. Without this mechanism, job orders may appear open that are actually closed simply because the employer did not return the validation form.

Fifth, while the data is incomplete, it seems reasonable that in some cases the job bank will utilize the computer more efficiently than the matching system. The primary reason is that the on-line matching systems function best if they have sole access to a central processor. This results in periods of slow activity when other agencies could be using the device. Most job banks utilize a time-sharing arrangement wherein only the actual run times are charged against the system.

Some have argued just the reverse, but with a different sense of "efficient." They feel that the simple job bank processing routines should not be computerized at all. Except for some of the statistical reports generated by the operation, it can be argued that the processing of job bank data is an inefficient use of computers.

Sixth, as the name implies, the job bank is a listing of available jobs. However, it is only one side of the placement process. The matching systems, as the name implies, attempt to provide some automated link between the two sides of the market. This advantage of the matching systems allows them to give the applicant or job order double exposure by screening both ways.

Seventh, the automated systems both produce a number of reports for internal and external use. However, the matching systems go beyond the job banks in providing labor market information in the sense that they can provide it instantaneously and for both sides of the market. For example, an employer can call the local office and within a matter of minutes know how many applicants are available in a particular occupational category. While the local office files will only contain a relatively small segment of available applicants in most cases, it will give the employer some indication of the availability of particular types of workers.*

*While the effectiveness of the Employment Service varies by occupation, industry, and area, in general this agency fills less than twenty percent of all available job openings.

The same type of information can be used by employers that are considering the labor area for possible expansion or location of a manufacturing facility. In a relatively short time, the computer can display a profile of available applicants that would be suitable for work in the industry. Again, only a segment of the available work force will be represented, but it will provide the prospective employer with an indication of the availability of required workers.

As can be seen in the above discussion, the two concepts have many similarities, but many unique attributes as well. The vastly simplified job bank is much more restricted in actual operation and in its potential usefulness. The matching systems provide or potentially can provide considerably more information and operational advantages than the job bank. Whether or not these differences are worth the additional cost is the subject matter of Chapter III.

Current Status of the Two Concepts

Enthusiasm toward the matching systems has diminished. The four systems are still operational, but the further expansion of their capabilities has been left for internal system initiative. Federal administrators are not providing research and development funds for expanding these systems. The rationale, of course, is that the existing matching systems have not and probably cannot be adequately evaluated. Therefore, a phased implementation scheme* has been adopted for expanding the job bank operations.

The job bank is now seen as an interim system, but it was not always viewed as such. It is now seen as a transitional component of the matching systems with full recognition that it can stand alone as an operational entity. Therefore, with the 106 job banks in operation, attention is now being given to their expansion to matching systems. The scheme has been outlined in the *Phased Implementation Progression for Computer-Assisted Manpower Operations Network.** The rationale for this progression appears conceptually sound, but its practical application is subject to criticism. In any case, the progression is beginning and the results of the transition will be interesting.

The Manpower Administration has committed a vast amount of resources in the development of computerized job matching. Therefore, while it is unlikely that the four systems currently operating will be expanded, it is virtually certain that they will remain operational for the forseeable future. Some feel they have served their purpose by demonstrating the feasibility of matching, but most will agree that their usefulness has not ended.

Summary

Conceptualizing these systems from the "armchair" perspective and at an intuitive level is rather easy. Putting these concepts into an operational framework is vastly more difficult. If anything has been learned in the last six years that no one will dispute, it must be that the operational difficulties are far more complex than originally anticipated. In retrospect, no one should have been surprised. The Employment Service was in effect attempting to automate a system that had significant shortcomings as a manual system. Not the least important of these problems was the development and use of an effective descriptor system.

Nevertheless, the experience with these systems has resulted in a body of knowledge that is likely to have far reaching implications for automated systems in both the public and private sectors far beyond the matching of men and jobs. The automated placement systems deal with live human beings and attempt to do more than merely shuffle data in various ways. In this capacity a number of strengths and weaknesses have arisen. This chapter outlined several of these characteristics. The next chapter will examine some cost and activity data pertaining to their operation.

Chapter III

ACTIVITY AND COST DATA PERTAINING TO COMPUTER-ASSISTED PLACEMENT SYSTEMS

The computerized systems have produced a proliferation of data on a wide range of performance indicators. Some of the data is apparently valid, much is highly questionable. The Division of Manpower Matching Systems conducted validation studies on several job banks and found the data reasonably accurate. However, the data from the Denver Job Bank was highly questionable and is not being used in system evaluation. The systems are new and the reporting mechanisms are in a state of flux. Therefore, it would not be surprising if there are errors or omissions in the data base. In any case, the data used in this dicsussion will be neither comprehensive nor definitive. Several series will be utilized to demonstrate in a preliminary manner what the systems are doing and what changes have occurred and can be expected to occur. The analysis is primarily inter-temporal and inter-system. Without a determination of data validity available, confidence criteria will not be utilized in this preliminary examination.

Placement Speed

The first activity indicator that provides some indication of the impact of computerization is the speed of placement. More specifically, this data element shows the "number of days required from receipt of job orders to referrals that resulted in a placement." Base data is very limited in coverage, but the Division of Manpower Matching Systems analyzed activity data for pre-job bank activities in 16 job banks. This data will be used in the analysis. Table I shows in summary form the results of the 16-system study.

While it's easy to be negative about the contribution of these systems, it is probably fair to say that in terms of the speed of service they haven't made a significant difference. This is particularly true after the first day of placement activity. How do the systems in this study compare with the 16-system examination? There is one matching system and eight job banks in the comparison. The activity indicators are for "five days or less"

Table I
Number of Days Required from Receipt of Job Orders to Referral That Resulted in a Placement

System	Percent			
	Filled Same Day	1-2 Days	3-5 Days	6-10 Days
Pre-Job Bank	35.7	21.4	12.7	11.7
Post Job Bank	22.0	30.2	16.1	12.0
Pre-Job Bank	35.7	57.1	69.9	81.5
Post Job Bank	22.0	52.3	68.4	80.5

Source: Analysis of Job Bank Operations Review Data for 16 Job Banks, March 26, 1971.

and "ten days or less" and they are for varying time periods. Table II shows the results of the data on these systems on a cumulative basis as compared to the data on the 16-system study.

The first and most obvious difference in the comparison is the percent of "Filled Same Day" orders. After job bank installation, only 22 percent of the job orders were filled on the day of receipt as compared to 35.7 percent before job bank installation. The explanation the Division of Manpower Matching Systems gave for this large discrepancy was that the central order taking procedure resulted in a one-day delay before the job order was exposed fully to the applicant side of the market. The relationship quickly converged during the subsequent time period until in the 6-10 day interval they were virtually the same. Figure 1 graphically depicts the convergency sequence.

This relationship can have several interpretations. First, it can be argued that the job bank doesn't improve or detract from the service given to the client groups. The small difference after the t=5-10 period is unlikely to prove significant. Second, it can be argued that the total job bank mechanism has resulted in deteriorated service because clients are forced to wait additional time before a placement occurs. This seems to contradict the "one-stop service" objective of the USTES.

The first point of this comparison shows that there is a wide variation between systems, i.e., for five days or less they vary from 30.9 percent to 81.7 percent and for ten days or less they vary from 56.9 percent to 90.0 percent.

Table II
Comparison of Number of Days Required from Receipt of Job Orders to Referral that Resulted in a Placement (for One Job Matching System and Six Job Banks)

System	Month	5 Days or Less		10 Days or Less	
		Pre-Job Bank	Post-Job Bank	Pre-Job Bank	Post-Job Bank
16-System Study	Variable	57.1 Percent	52.3 Percent	81.5 Percent	85.5 Percent
Jacksonville	6-71		47.4		69.6
Paterson	4-71		60.2		71.9
Paterson	8-71		60.4		71.2
Wilmington	10-70		73.5		86.8
	4-71		75.9		87.7
	9-71		75.0		89.7
St. Louis	4-70		31.7		63.0
	5-70		30.9		56.9
	10-70		48.5		66.0
Columbia	10-70		50.3		60.3
	11-70		55.5		63.3
	12-70		55.9		68.9
	1-71		54.1		62.3
	3-71		64.8		74.7
	4-71		61.3		75.8
Omaha	1-71		70.6		79.3
	2-71		64.4		79.8
	4-71		68.6		81.3
	6-71		65.0		79.2
Utah	3-71		50.1		70.5
	4-71		57.1		74.6
	5-71		53.0		69.1
	6-71		45.1		59.2
	7-71		51.9		65.9
	8-71		53.9		67.3
	9-71		53.1		69.1
	10-71		56.1		74.1
Phoenix	4-71		81.7		90.0
	5-71		74.4		88.9
	6-71		71.8		84.4

Source: Job Bank Operations Review Reports.

Due to the varying time periods, the arithmetic mean is not particularly useful. However, it does indicate that the systems are well within reasonable limits on an aggregate basis. The Utah matching system is clearly in line with the post-job bank data for five days or less but falls somewhat short for the ten days or less period. These data seem to reconfirm the above conclusion that the computerized systems have not made a significant difference in the speed of service.

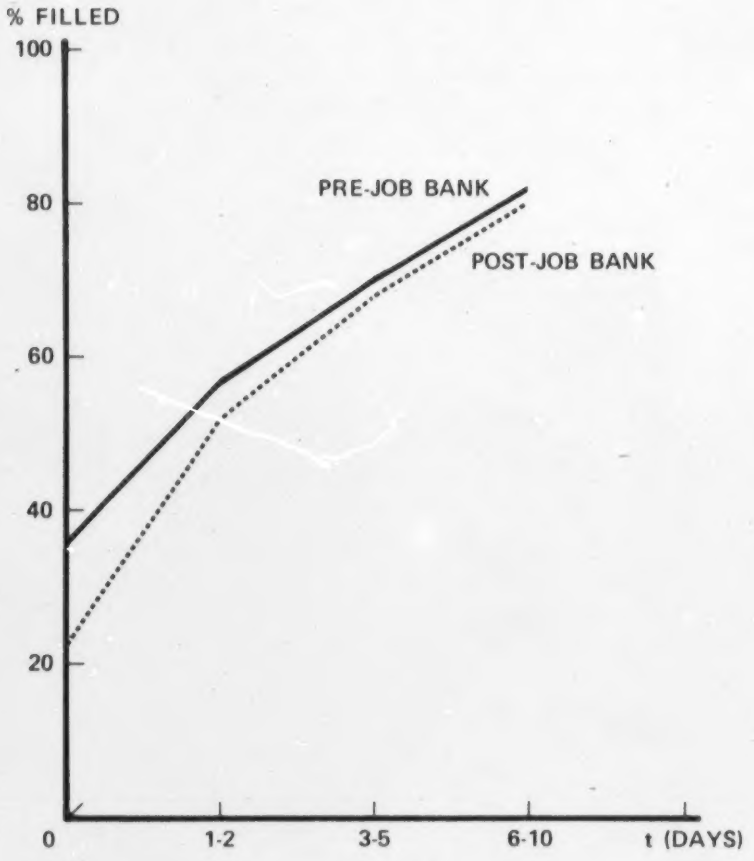

FIGURE I

Speed of Placement by Occupational Group. Employment Service interviewers can generally pick out a number of occupational categories in which placements are either very easy to make or are very difficult. This group will vary by labor market conditions, type of clientele, industrial composition, etc. Some interviewers may purposely attempt to direct their efforts toward the "easy" placements and away from the more difficult ones. This is the case for two reasons: 1) placements are the culmination of his efforts and the more he can make the better he feels; 2) he is

judged as a good, average, or poor interviewer depending on the number of placements he makes. It is doubtful that many interviewers have consciously determined in an objective way which are the easy and difficult placements, but experience is a fairly good indicator.

Job bank data permits an explicit determination of placement speed by occupation. An interviewer could conceivably analyze these data and based on this analysis select those occupations that are typically filled very quickly in his labor area. The data for five job banks show a clear dichotomy between the upper and lower segments of the occupational spectrum. Two-digit DOT occupations between 00 and 50 are filled much faster than average and those between 51 and 98 (first and fourth digit of DOT) are filled much slower than average. The implications of this analysis are that the Employment Service may be able to structure their placement activity in such a manner as to maximize overall placements (if in fact maximum labor market penetration is their goal).

There are inconsistencies in the data, but in general, the trend is clear. More in depth study of more systems over longer time periods will be needed to refute or confirm this observation, however. If in fact there is a significant difference, the Employment Service may make substantial gains in overall placements by concentrating more effort on certain occupational groups. It is already known that there is significant differences in the industrial composition of placements and the above type of analysis can serve to clarify further the structure and composition of Employment Service activity.

Wage Distribution of Employment Service Placements. A third performance indicator is the change in the wage structure of computerized placement. Conceptually, it could be expected that the percent of placements in the higher wage categories would rise because of the wider exposure of applicants to job orders. Table III shows the results of the 16-system study for all applicants and for the subset of disadvantaged applicants. For the systems in the study, the structure of wages improved considerably. The percent of placements at less than $1.61 per hour declined for the total group and for the disadvantaged segment. Placements of $2.80 per hour or more increased significantly for both groups. There is no reason to believe that overall economic conditions or increases in wages generally had a significant impact on the observed results.

Table III
Wage Distribution in the Job Bank System

Hourly Wage Rate	Percent Pre-Job Bank (3 months)	Percent Post-Job Bank (3 months)
All Applicants		
Less than $1.61	36.2	32.5
$1.61 - 2.19	37.1	37.4
2.20 - 2.79	17.6	18.0
2.80 or more	9.1	12.1
Disadvantaged Applicants		
Less than $1.61	50.9	42.6
1.61 to 2.19	32.8	37.1
2.20 to 2.79	11.4	12.6
2.80 or more	5.0	7.7

For the systems represented, the mean of the two groups and for the four wage levels has been calculated. A wide disparity between the total number of placements and those that were classified disadvantages is clearly apparent. Table IV indicates that 32.1 percent of all job bank placements were in job openings paying less than $1.61 per hour whereas 35 percent of disadvantaged placements were in this group. In the $2.80 or more wage category, 13.7 percent of all job bank placements were in job openings paying this amount while only 9.0 percent of disadvantaged placements were at this level. The relationship between the job banks and Utah's CJM is interesting, but the comparison may not be valid. There were ten job banks in the sample representing many labor areas. Also, the time intervals were not strictly comparable. While the wage structure of the job banks appears "better" it can be the result of variation in the area's wage structure, or other economic factors. More study is needed for a reasonably definitive statement.

Table IV
Average Wage by Client Group for Selected Cities and Time Periods

Hourly Wage	Job Bank Percent Total	Utah Percent Total	Job Bank Percent Disadvantaged	Utah Percent Disadvantaged
Less than $1.61	32.1	34.3	35.1	34.7
$1.61 - 2.19	41.4	37.2	42.0	44.3
$2.20 - 2.79	19.4	14.8	12.5	13.7
$2.80 or more	13.7	10.1	9.0	5.3

The Results of USTES Referrals to Job Orders. When an applicant is referred to a job opening, one of three things can happen. The employer can reject the applicant; the applicant can reject the job opening; or, the applicant can accept the job, but fail to report for work. The latter two are a culmination of similar forces and will be combined for this analysis. Table V shows the results of USTES referrals for the Utah CJM and ten job banks. As expected, the vast majority of referrals that do not result in a placement are because of rejection by the employer. Job refusals by the applicant are a relatively small portion of the total (typically 1 - 3 percent). The overall referral-placement ratio for the USTES has been about two-to-one. This relationship is clearly in line with the results of these data.

While it varies between systems, an interesting relationship exists between disadvantaged referrals and placements. As indicated above, for the total number of referrals, the employer rejection rate appears to be in line with the expected referral-placement ratio of about two-to-one. However, the employer rejection ratio for disadvantaged clients is substantially lower than it is for the total group. In most cases, the latter was significantly higher than the former. Similarly, in only ten months was the applicant job refusal rate by disadvantaged clients greater than the rate for the total client group. There are clear indications that the success rate of disadvantaged referrals is greater than for all referrals and the legitimate question is why?

There are several likely explanations, no one of which may totally answer the question. First, it is likely that some disadvantaged clients are really not disadvantaged to the extent that their ability to find a job is impaired. Second, the disadvantaged clients that end up at an employer's interview desk are really a very select group. Many clients of this type enter training programs, participate in counseling and job orientation activities, receive special assistance in preparing for and taking employment examinations, etc. Therefore, many do not come in contact with an employer until they have much of their "disadvantagedness" removed. Third, to fulfill Equal Employment Opportunity guidelines or simply a social or moral obligation, some employers seek out disadvantaged applicants of various types. Fourth, there are usually job development or other types of "conditioning" contacts made before the disadvantaged applicant actually applies for the position. In this way, employers understand the situation and are

Table V
Results of USTES Referrals to Job Orders
for Selected Systems and Selected Dates

Date	System	Referrals		Rejected by Employer				Refused Job			
		Total	Disadv.	Total	Percent	Disadv.	Percent	Total	Percent	Disadv.	Percent
10-70	New Haven	1,101	190	496	45.0	77	40.5	26	2.3	1	0.5
4-71	New Haven	1,139	164	706	61.9	87	53.0	32	2.8	0	0.0
9-71	New Haven	1,531	158	841	54.9	79	50.0	48	3.1	2	1.2
4-70	Miami	2,899	364	1,296	44.6	146	40.1	209	7.2	19	5.2
10-70	Miami	1,115	192	372	33.3	53	27.6	45	4.0	4	2.0
4-71	Miami	4,170	663	2,003	48.0	294	44.3	91	2.1	9	1.3
6-71	Jacksonville	2,593	536	1,431	55.1	301	56.1	28	1.0	7	1.3
4-71	Paterson	2,144	919	1,038	48.4	383	41.6	22	1.0	7	0.7
8-71	Paterson	2,887	1,144	1,354	46.8	475	41.5	55	1.9	11	0.9
10-70	Wilmington	679	173	377	55.5	101	58.3	5	0.7	2	1.1
4-71	Wilmington	937	212	477	50.9	126	59.4	21	2.2	4	1.8
9-71	Wilmington	1,377	417	694	50.4	195	46.7	29	2.1	7	1.6
4-70	St. Louis	4,047	963	2,217	54.7	567	58.2	76	1.8	5	0.5
5-70	St. Louis	4,227	1,046	2,307	54.5	622	59.4	68	1.6	10	0.9
10-70	St. Louis	5,142	1,455	2,760	53.6	772	53.0	84	1.6	16	1.0
10-70	Columbia	1,635	376	817	49.9	158	42.0	48	2.9	3	0.7
11-70	Columbia	1,304	273	627	48.0	104	38.0	33	2.5	2	0.7
12-70	Columbia	1,227	200	573	46.6	90	45.0	31	2.5	6	3.0
1-71	Columbia	1,492	196	804	53.8	88	47.3	39	2.6	2	1.0

Table V (cont.)
Results of USTES Referrals to Job Orders
for Selected Systems and Selected Dates

Date	System	Referrals		Rejected by Employer				Refused Job			
		Total	Disadv.	Total	Percent	Disadv.	Percent	Total	Percent	Disadv.	Percent
3-71	Columbia	1,968	340	987	50.1	146	42.9	46	2.3	11	6.2
4-71	Columbia	1,657	294	753	45.4	106	36.0	38	2.2	7	2.3
3-71	Phoenix	7,008	395	5,121	73.1	293	74.2	51	0.7	3	0.8
4-71	Phoenix	7,636	334	5,317	69.6	242	72.5	86	1.1	0	0.0
5-71	Phoenix	7,098	787	5,042	71.0	558	70.9	78	1.1	7	0.9
6-71	Phoenix	7,975	1,406	5,726	71.8	973	69.6	66	0.8	6	0.4
6-71	Philadelphia	3,856	1,231	2,348	60.9	696	56.5	115	3.0	38	3.1
3-71	Utah	7,069	1,018	4,026	57.0	410	40.3	81	1.1	8	0.8
4-71	Utah	7,055	1,064	3,988	56.5	480	45.1	71	1.0	6	0.6
5-71	Utah	7,569	1,091	4,298	56.8	487	44.6	52	0.7	5	0.5
6-71	Utah	9,300	1,436	5,199	55.9	445	31.0	72	0.8	7	0.5
7-71	Utah	7,273	1,116	3,864	53.1	369	33.1	32	0.4	3	0.3
8-71	Utah	8,573	1,092	4,716	55.0	459	42.0	58	0.7	1	0.1
9-71	Utah	9,240	1,199	5,195	56.2	474	39.5	63	0.6	2	0.1
10-71	Utah	9,079	1,194	4,877	53.7	476	39.9	50	0.6	4	0.3
1-72	Omaha	1,061	152	523	49.3	66	43.4	26	2.5	5	3.3
2-71	Omaha	1,289	249	695	53.9	116	46.6	34	2.6	9	3.6
4-71	Omaha	1,387	278	700	50.5	137	49.3	29	2.1	6	2.2
6-71	Omaha	1,678	456	890	53.0	179	39.3	21	1.3	4	0.9

likely to be more receptive to the disadvantaged referral on a one-to-one basis.

Reasons for a lower refusal rate by disadvantaged applicants should be intuitively clear. Typically, these individuals have been unemployed or underemployed for extended periods and the potential job opportunities are fewer in number. Therefore, when a job opening arises in which an offer actually occurs, the disadvantaged applicant will likely be under greater pressure to accept the position than will applicants in general. In addition, job development activities and pre-referral counseling condition the disadvantaged applicant to the type of employment likely to occur, working conditions, wages, etc., so that few "surprises" occur at the employment interview.

These are some of the factors that determine the referral-placement ratio. Certainly there are other factors that may be equally as important in some circumstances. There are likely to be significant differences in the industrial and occupational referral-placement relationships, but available data does not permit this type of analysis.

Industrial Analysis of Placements. Traditionally, certain occupations and industries have been closed or partially closed to minority* groups. The restriction has never been total, but it has been prevalent enough to result in disproportionate numbers of minority workers in the service and manufacturing industries whereas finance, insurance, and real estate industries have a very small proportion. Manufacturing and government have a high proportion of minorities; agriculture, forestry, fisheries, and public utilities have a low proportion. The pattern is clear and it has persisted for decades.

There is considerable discussion within both the public and private sectors claiming that the composition of non-white industrial placements is becoming more equitable. The arguments are generally couched in a changing national conscience or moral character of the nation. There may in fact be a movement underway, but until recently very little objective data was available to substantiate or refute the contention. However, the

*Synonymous with "non-white" in this study.

job bank system has a table in the Job Bank Operations Review series that examines the phenomenon. Without adequate base information, little can be said about an improvement or deterioration in the racial composition of placements. However, it is interesting to note that in some areas (Paterson, for example) the composition of placements in some of the "restricted" occupations is in line with total placements. In Paterson, the placement of non-whites in the finance, insurance, and real estate industries is relatively high. A similar statement can be made about Rochester's situation. In any case, these data may indicate that a change is in progress. What the magnitude of the change is, is not clear. However, if the data series is maintained, firm indications should be observable in two or three years.

Job Bank and the Unemployment Rate. Though not an explicit goal of the computerized system, it seems reasonable to expect these systems to have an impact on employment and unemployment. It must be remembered, of course, that the Employment Service only handles about one-in-seven of total new hires. Therefore, their potential impact is diluted to a considerable degree. It is still important to ask, however, whether or not the unemployment rate is appreciably different in job bank and non-job bank areas.

Without the benefit of a complete set of 1971 data on unemployment (ten months are available), a provisional look at 1970 data can be made. Seven of the 11 systems operated six months or less in 1970, two operated about eight months. The Utah matching system has been in operation officially since January 1969, but in reality since late 1967. The St. Louis job bank began operation in June 1969. Several observations can be made relative to these data.

First, it would be difficult to demonstrate that a significant difference exists between the changes in the national unemployment rate and those of the job bank areas. Second, the Utah CJM is in a labor area that does not experience wide fluctuations in the unemployment rate. These small changes continue to exist and there are no indications that the CJM has had a perceptible impact on changes in this rate over the past three years. Third, these data do not show the impact of the systems on particular client groups. It seems reasonable to expect that some client groups, i.e., disad-

vantaged, have experienced improved employment conditions in some job bank areas.

These are some of the indicators that can be utilized to assess the effectiveness of the computer-assisted operations. They are not complete in terms of activity coverage or period of operation. They should be looked at as being suggestive rather than definitive. A much more in depth analysis must await the generation of extended series of operational data.

The next section will briefly examine another aspect of system operation. In this case the analysis will focus on the cost of these systems and an attempt to determine how the matching systems compare with the job bank network. The cost data were provided by administrators of three matching systems and Charles Becherer, Comptroller, Manpower Administration.

Computer-Assisted Placement Cost Analysis

The matching systems evolved rapidly between 1968 and 1971 and the cost estimates pertaining to them showed an equally rapid increase. The job bank implementation time table showed the most rapid increase in 1970 and 1971. With implementation nearing completion, few new job banks were started in 1972. No new matching systems will be developed outside the job bank PIP framework.

Without question, the automation process has been expensive. There are no accounting figures available that will precisely identify all costs of these systems, but there are several sources of well informed estimates. The first estimate of overall cost of the job bank system was made by Dr. Arnold Weber, Assistant Secretary of Labor for Manpower, DOL, in 1971 appropriations hearings. When asked how much it would cost to cover the entire country with the job bank program, he felt that a "...seat-of-the-pants estimate was somewhere in the vicinity of $80 to $100 million per year."* These presumably are annual operating costs. Job bank installation costs for 1970 and 1971 were $7,500,000

*"*Department of Labor and Health, Education, and Welfare Appropriations* for 1971, Hearings before a Committee on appropriations, House of Representatives, 91st Congress, 2nd Session, Part 5, Department of Labor," U. S. Government Printing Office, Washington, 1970, p. 134.

and $13,500,000 respectively. More specifically, Malcolm Lovell, Assistant Secretary, Manpower Administration, DOL, responded to the question on budgeting by saying that "For job banks in 1971, we are budgeting a total of $13,500,000. In 1970, it was $7,500,000. We currently have 16 job banks in operation, and we hope to have 56 in operation by the end of this fiscal year." * Anticipated figures for 1972 are not yet available.

Specific installation and operating costs of the job banks will be identified as they are incorporated into the study. The three matching systems have more detailed cost breakdowns for the initial years of operation and they, too, will be identified as they are used in the study. Finally, it should be pointed out that there are two sources of funding for these programs, i.e., Grants to States Trust Funds and Manpower Development and Training Act Funds. It is interesting to note that Mr. Becherer identified the fundamental problem in cost evaluations of computerized systems when he stated "Implementation and operating cost data is not available in that state agencies are not required to report this information separately from other costs within the two fund sources."** The cost data pertaining to the matching systems will be presented first.

Cost Comparisons of Three Matching Systems. Table VI shows the cost estimates pertaining to the Utah, Wisconsin, and California systems.*** It is important to reiterate again that the cost data are only estimates and that they do not purport to be cost accounting figures.

Also, these data provide information on three "variations" of the Utah CJM. The alternative Utah systems have been designated, Utah (1) which is an "add-on" system, Utah (2) which is a "stand-alone" configuration, and Utah (3) which is the "present" operation. If in fact a legitimate comparison can be made, it appears reasonable that it must be made between the LINCS, ESOPS, and Utah (2) "stand-alone" systems.

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*Ibid, p. 344.

**Letter, Charles J. Becherer, Comptroller, Manpower Administration, July 27, 1971, Nordlund Letter File.

***Cost data for the New York AMDS was not provided when requested.

Table VI

Cost Comparisons of Three CJMs

Year	System	Cost
FY1968	LINCS	$294,800
FY1969	LINCS	381,660
FY1970	LINCS	331,260
FY1971	LINCS	est. 330,000
FY1968	ESOPS	$ 38,130
FY1969	ESOPS	137,635
FY1970	ESOPS	410,876
FY1971	ESOPS	490,923
Estimates for Utah Made in 1971	Utah (1)	$186,140.04
	Utah (2)	358,113.04
	Utah (3)	610,632.96

Based on these cost estimates, with full recognition that they are not "acounting" figures, and that for many reasons the systems are not strictly comparable, i.e., labor market differences, system operation, occupational and geographic coverage, hardware, etc., it may be interesting to examine briefly several cost/activity ratios. Before developing these ratios, it must be clearly understood that they do not represent cost comparisons that imply one system's superiority over the others. Factors other than cost, i.e., level and extent of service, efficiency, occupational and geographic coverage, etc., are typically of more importance than a tabulation of cost estimates.

An initial observation about the cost structure of the matching systems, one that can be substantiated by discussions with federal and state administrators, is that annual operating costs have stabilized in the $300,000 to $500,000 range. Apparently there will be no "new" federal funds for experimentation and development of the four systems and therefore it is likely that the current level of operation will be retained. In any event, for purposes of comparison, the final year's cost figures for the LINCS and ESOPS systems will be used in conjunction with the Utah (2) "stand-alone" estimates. Three activity categories will be used in the analysis, i.e., new applications, referrals, and placements. Table VII shows the cost/activity comparisons for FY1971.

Enough is known about geographic and occupational coverage as well as method of operation to suggest that significant

Table VII
Cost/Activity Comparisons of Three Matching Systems

System	Year	Cost	Cost/Application	Cost/Referral	Cost/Placement
LINCS	1971	$330,000	$9.68	$4.37	$670.73
ESOPS	1971	490,923	3.22	3.44	13.52
Utah (2)	1971	358,113	5.88	4.61	12.60

differences probably exist between the systems. However, what is important is that a given level of resources was committed in a given system to improve that system's operation. Often the data for a segment of a total system cannot be ascertained for a representative period. Therefore, total system data was utilized in the analysis. This is particularly important in relation to the LINCS and ESOPS systems.

Much can be made about the differences in these figures and equally as much can be said about the similarities. What can probably be said with some degree of confidence is that they are comparable in order of magnitude. Data on the LINCS system, in two categories, is out of line with the Utah and Wisconsin systems. The cost/placement estimate must not be interpreted as an indication of system effectiveness. The activity data showed only those placements that could unambiguously be attributed to the LINCS operation. This amounted to only 492 placements in FY1971. With over 75,000 referrals during the same period, it would be expected that placements numbered in the 25,000 to 35,000 range. Likewise, only 34,080 new applications were registered in the LINCS system in FY1971. Considering that it only operates in a limited segment of the occupational spectrum, i.e., professional, technical, and managerial, it may not be surprising to find a significantly smaller number of new applications. The remaining cost-activity ratios are clearly in a comparable range particularly considering the magnitude of differences inherent in the systems.

The above comparisons utilize annual data. Most of the job bank data was available on a partial year basis. To provide a degree of comparability, job bank operating cost was calculated on a monthly basis and then applied to monthly activity data. Table VIII shows referral and placement data for three job banks. Comparing these data to the 1971 matching system data, several interesting observations arise. First, the job bank data is significantly higher in both categories by about a factor of two. Second,

Table VIII
Activity Data for Three CJMs

Date	System	No. Referred	No. Placed	$/Month	$/Referral	$/Placement
10-70	Columbia	710	224	$4,480.67	$ 6.31	$20.00
11-70	Columbia	533	159	4,480.67	8.41	28.18
12-70	Columbia	430	135	4,480.67	10.43	33.19
3-71	Columbia	560	192	4,480.67	8.00	23.34
4-71	Columbia	489	144	4,480.67	9.16	31.12
5-71	Columbia	555	151	4,480.67	8.07	29.75
					X=8.20	X=26.75
3-71	Wilmington	937	228	4,527.42	4.83	19.86
9-71	Wilmington	377	360	4,527.42	3.29	12.58
					X=3.91	X=15.40
1-71	Omaha	1,061	289	9,590.67	9.04	33.19
2-71	Omaha	1,289	267	9,590.67	7.44	35.92
4-71	Omaha	1,387	377	9,590.67	6.91	25.44
6-71	Omaha	1,678	429	9,590.67	5.72	22.36
					X=7.08	X=28.17

the monthly cost of the matching systems is higher than the job banks by a factor ranging from three to six. However, the activities attributed to them are sufficiently large to reverse the cost/activity ratios. Third, even though the Omaha Job Bank received about twice as much money as the other two systems, its cost/activity ratios are not lower than the other two. This may suggest that there were no economies of scale present in the larger operation.

These observations are interesting, but not conclusive. They are suggestive of several fundamental relationships, but they are not definitive. The time periods are short, the operations are vastly different, and the coverage geographically, occupationally, and operationally is significantly different. Only three activity indicators were examined. These were chosen because of their traditional usage and because most observers can conceptualize what they represent. They may not be accurate barometers of agency operation, but nonetheless they are suggestive. Needless to say, much additional work must be done in terms of comparative analysis between systems and types of systems.

Conclusion

This chapter has outlined some preliminary activity-cost data pertaining to computer-assisted placement. An effort was made to develop some inter-systems comparisons by using cost/activity ratios. These ratios suggest that there are differences in the two concepts, but data limitations prevent a definitive statement. It would be surprising indeed, if these differences did not arise.

The next chapter will examine the issues that are most important to the computerized effort. This will be followed with an outline of the critical issues pertaining to the Employment Service in general. Second, the PIP is the scheme under which current implementation is proceeding. This process will be analyzed critically and the apparent directions of change will be identified.

Chapter IV

CRITICAL ISSUES PERTAINING TO COMPUTER-ASSISTED PLACEMENT SYSTEMS

The major efforts expended on the design, development, and implementation of computerized placement have resulted in the attainment of a vast body of knowledge. Unfortunately, this knowledge is neither comprehensive nor compiled in a central information bank. Everyone seems to know something about all the systems, but at present the integration of this information into a comprehensive whole has not occurred. There are still a number of unsettled areas as Chapter Five will illustrate. The current "state of the art" is vastly more advanced in many areas over what it was in 1964, but there are several areas that seem to elude the best efforts of Employment Service and computer experts. These areas are primarily concerned with the technical application or integration of computers with Employment Service operations. These problem areas will ultimately be resolved as understanding of the mechanics of integration occur. However, on a more advanced level there are a number of issues that must be addressed that concern the overall direction of implementation. These issues are the focus of this section.

The first and probably most important issue is whether the USTES is approaching the computerization effort in a socially, politically, and economically justifiable manner. In other words, can the present direction of computerization, i.e., the evolution of job banks into matching systems, be justified if examined in terms of its social contribution, political impact, and economic efficiency? Each of these aspects must be considered further. It must be remembered, however, that all three are interrelated and in a sense are different ways of looking at the same phenomena.

The social contribution of these systems can be very great or it can be negligible. Their potential for increasing social welfare by improving the movement of workers into and out of jobs is conceptually clear. Their potential for improving the work relationship by placing workers and employers in a more compatible situation is also clear. There seems to be general agreement that job longevity, improvement in the wage structure, job satisfaction and job security, reduced absenteeism, increased productivity, and many other facets of the work can be

manifested by facilitating the operation of the labor market via computers. However, whether these social gains can in fact be achieved is the real question. There is virtually no evidence that the current systems have made significant gains in these areas.

The political aspects of this development are less diverse and in a sense are more amenable to fulfillment than the remaining two elements. This is true primarily because the impact of these systems on political decision-making is less direct and the results on the political process are more easily identified. Once it became apparent in 1967 and 1968 that computers could be integrated with the activities of the Employment Service, it became a political game to see who could get the systems installed in their political jurisdiction first. There was serious internal disruption occurring at the same time and mayors and governors were hard pressed to show that they were doing "something" to assist their constituency to find employment. In retrospect it was indeed fortunate that the job bank concept materialized at the crucial moment. Job matching was feasible but could not have been implemented on a large scale.

In any event, the implementation of job banks occurred on a large scale with one being developed in 1968, eight in 1969, 50 in 1970, and 47 in 1971. Concurrent with this process though not as a result of it, the internal upheaval subsided. The pressure on elected officials diminished but the implementation schedule was maintained. There are currently 106 job banks and four job matching systems in operation.

There is probably little question that the installation of the job bank network has appeased the political leaders in most areas. Likewise, it has removed the USTES from criticism from most political leaders. With the present systems covering about one-half of the nation's population, there is unlikely to be additional political pressure for change unless it can be shown that the systems are not in fact achieving their original objectives. The remaining population is located in smaller towns and cities or in rural areas and the political clout generated by them is insufficient to procure a computerized system.

There are political ramifications of a different nature that are also very important. The internal decision making in the U. S. Department of Labor, Manpower Administration, and the USTES,

are heavily weighed by political considerations as opposed to economic or overall social considerations. The political and philosophical positions of the top level administrators in all of these governmental units profoundly affect what will be done, how it will be done and when it will be done. For example, as seemingly a simple matter as obtaining timely operating data from the systems was often frustrated because of the inability of the USTES to compel them to provide it. When asked how this situation could exist when the funding and overall control was federal, a top level administrator in the Division of Manpower Matching Systems replied that it was not "politically realistic" to consider withholding funds or applying other pressures to the negligent systems. With the possibility of prompting the criticism of a federal congressman, the administrators of these agencies would rather attempt to persuade the system administrators to provide the needed data then take more positive action. As a consequence, the data was often incomplete and untimely.

A similar problem concerns the reporting requirements in terms of before-after operation. The Manpower Administration only required that the systems submit monthly reports for one year after installation. Most systems have complied with this requirement. However, in retrospect the reporting requirement should have been for an on-going sequence of monthly reports. What has happened is that some systems discontinued their reports before others started reporting. Economic conditions are continually changing, unique labor market conditions require long term examination, and the operation of some of the systems was such that the data produced was of no value (the Denver Job Bank is a good example). A single twelve-month examination of these systems is not enough considering the above factors. It does not seem unreasonable that the job banks should have been required to submit these reports as long as they were considered useful at the national level. They are not overly burdensome to produce and some systems have continued to produce them for internal use. It might be noted that the USTES is phasing out the Job Bank Operations Reports (JBOR) and integrating them into Employment Service Automated Reporting System (ESARS). This will in effect pick up many of the same elements from most of the job banks that were in the JBOR system, but there will be months and in some cases a year or two gap in the data. These data may be some of the most important and it is unfortunate that they will not be available for close examination.

Clearly, the political factors impinging on the computerized systems are nebulous and often frustrating. Frequently political decisions are based on expediency with little regard for the myriad of other considerations. This, of course, is recognized as an integral part of the overall political process and as such should not be overly disturbing. However, what is most disturbing is that many political decisions are made contrary to the evidence produced by other sources or with incomplete information.

The last principal consideration of the computerized effort is its economic efficiency. There are several levels of consideration. It can be examined in terms of a direct cost-benefit analysis, i.e., whether the benefits are greater than costs incurred. It can also be examined in terms of its cost effectiveness, i.e., given the operational parameters of the system, how its objectives can be most economically achieved. Both analytical techniques are within the more general framework of determining whether or not the expenditure of resources on computerized placement can be justified in relation to the vast number of alternative resource uses. If the political decision has been made, as indeed it has, that these systems will be designed, developed, and implemented, then the lower level analysis must be used. We can still argue, of course, that in terms of achieving maximum social welfare, the resources should have been directed elsewhere. However, realistically we can only say that benefits exceed or fall short of costs or that to achieve this set of objectives it will require this level of resource expenditure.

In pure economic terms, we are interested in the most efficient use of our nation's resources. Overall efficiency can be expressed in terms of opportunity cost criteria. In other words, the expenditures of resources will always occur on the project in which there are no alternatives that will produce a larger net social gain. At a point in time we are faced with a number of alternatives or opportunities on which resources can be expended. By selecting one, we give up the opportunity to derive social benefit from the others. Hence, we will select the one that produces the greatest net social benefit.

This type of analysis requires the knowledge of all alternatives and the potential benefits they can produce. This information does not exist nor can we envision it ever existing. Attempts must be made to push the analysis as far as possible, but

considering the intractable nature of the theoretical definition of efficiency a much less complete analysis must be utilized. In some sense, economists should feel gratified that political decisions preclude the necessity for a complete analysis. These decisions delimit the area and type of analysis to a more manageable sphere.

These are some of the general components that must be considered in the first issue in the computerization effort. Most of them are highly qualitative in nature and therefore rely on informed judgment. Our level of understanding precludes a rigorous application of the analytical tools to them. Instead, the overall phenomena is analyzed piecemeal without adequate consideration given to the whole.

The second issue is more qualitative in nature and involves the philosophy that system administrators hold toward the type of service the USTES should be providing. The issue is whether the more complex on-line matching systems are necessary or whether the off-line batching processing systems will suffice. Impinging on this issue is the question of whether one-stop local office service is necessary to adequately serve the USTES clientele. The issue itself has been partially resolved in one sense, but remains open for debate in another. If the USTES feels that one-stop service is necessary (this is generally felt to be the case), on-line matching operations are required. There is the possibility, of course, of providing one-stop service by utilizing in-office files with a manual search. However, if the search is to take advantage of the total files, access to the computer on-line is essential. In any event, for the purposes of the discussion, we are assuming that administrators are striving for one-stop service and want to utilize the full applicant and job order files whenever possible.

The only matching system that utilizes the batch mode for its primary operation is, of course, LINCS. The segment of the occupational spectrum served by this system, i.e., the managerial, professional, and technical, generally encompasses applicants and job openings that do not require immediate action. In other words, most clients on both sides are looking more for a "quality" match than an immediate match. Therefore, the six-hour response time is not a major factor in considering whether to use or not use the LINCS services. On the other hand, in most occupations below the above group one of the primary considerations is not finding "the" man or "the" job, but "a" man or "a" job. Speed of service

is of the essence. While off-line matching is satisfactory for one group, it is clearly unsatisfactory for the other.

There are two segments of the second group that are particularly in need of immediate service. The first is the easy-to-place, relatively highly skilled individual and the relatively attractive job opportunity. The second is the very low skilled, unmotivated, discouraged worker that is on the verge of dropping out of the labor market. If the Employment Service does not find the very attractive applicant a job very quickly, he or she will be served by a private agency or will find a job on his own. The same holds for a very attractive job opportunity. Walk-in traffic, private agency referrals, word-of-mouth, etc., will usually prevent this job from remaining unfilled for long periods.

The polar case is equally as critical and is in a sense more difficult. The marginal worker that has a very difficult time finding a job usually becomes discouraged easily and is unlikely to return to the local office repeatedly. If an opening cannot be found on the first visit, this type of client is frequently lost. In addition, once outside the local office they are difficult to locate because of inadequate addresses, frequently no telephone, no previous employer contacts, etc.

For these types of applicants and job openings, a batch search is unlikely to be very effective. The whole idea is that they must be served while they are in the local office or are on the telephone. Once this contact is broken, the Employment Service is unlikely to be the agency receiving credit for the placement. Therefore, it seems reasonable that for the majority of local office activities, some form of on-line operation is needed. The typical employer and applicant is very impatient and except for the small minority of applicants that are not seriously looking for a job or employers not seriously seeking a suitable employee, some type of immediate service is needed.

This portion of the issue seems reasonably clear. What is not clear, is which combination of off-line – on-line screening is most effective. One is relatively inexpensive, the other is very expensive. Therefore, it becomes a matter of optimizing total service given the overall level of expenditures. Determining the cut-off point occupationally above which batch processing is acceptable will be very difficult. It will certainly vary by area and local office

because of the traditional relationship between the Employment Service and the community, the economic conditions prevailing, the type of industrial structure, and the effectiveness of the other placement mechanisms.

Nevertheless, it is an important issue that must be considered very carefully. It would seem desirable to have all transactions occurring on-line, but the expense of such a system precludes this eventuality. Therefore, some combination of the two appears most realistic and it will demand in depth analysis by system monitors to determine the optimum mix.

Even with a clear understanding of the appropriate combination, there are problems of how to optimize the internal matching process. For example, if we take the characteristics of applicant "A" and screen them against the job order file, we will get job orders "1", "2", "3", and"4" out of the system. One or more may be suitable for referral. If we take one of the job orders and run it against the applicant file, we may or may not pick up applicant "A." Therefore, it is an important consideration on which way the search is run, but we don't know how to optimize the process. Presumably, in an optimal situation, if we run applicant "A" against the order file and produce the above four job orders of which number "1" was the "best" selection and then run job order "1" against the applicant file we would come out with applicant "A" as the best match. This does not happen, however, because of coding deficiencies, inadequate search routines, tie breaking considerations, and the like.

Therefore, if we are only looking for a match, it really makes little difference that this situation exists. However, if we are attempting to make some type of optimal match, it is highly important to understand why this disparity exists and how a more optimal selection can be made. This is an issue of a highly technical nature but nevertheless impinges on the basic operational philosophy of what the systems are attempting to do. Much research and redesign will be needed to adequately address this question.

A third issue of supreme importance not only of the computerization effort in the USTES, but in many private organizations as well is the development of an acceptable descriptor system. Many efforts both public and private have been made to isolate

and identify the characteristics, qualities, and conditions that make for a successful, on-going work relationship. I think it is fair to say that there have been few major advances in this area in recent years. This is not meant to imply that no effort has been expended. On the contrary, all four matching systems have attempted to devise different descriptor systems and search strategies. The crux of the matter is that we do not know what factors or combination of factors is most important in the work relationship. Undoubtedly the combination is different between occupational groups and for a given individual over time. An individual may be more interested in the salary level early in his work career whereas retirement benefits, life insurance, medical plans, work conditions, etc., are more important later in life. Many of the employment conditions are quantifiable, many are not. Salary, hours, shift, occupational and industrial category, etc., can be meaningfully quantified; while attitude, interest, personality, habits, etc., generally cannot.

The implication of the above discussion is that a universally applicable descriptor system may be impossible. There may be no practical way to develop a descriptor mechanism that incorporates all of the relevant attributes mentioned. However, what is probably needed is not a comprehensive mechanism but a system that permits the interviewer to provide enough information about the applicant or job opening so that an initial comprehensive screening can occur. Several mechanisms of this nature now exist. The stumbling block is that we have these mechanisms, but not knowing what is really important, we have no means to evaluate them. There is an endless stream of verbiage about the superiority or potential superiority of a particular method, but very little hard data to support the contentions.

This is an important, interesting, and very frustrating issue. It involves the psychology of the applicant and the employer; it requires input from labor market, manpower, and industrial economists; it requires input from data processing personnel; and local office counselors and interviewers encounter types of problems and situations that must be covered. In short, an acceptable descriptor system will require inputs from a variety of sources. A single developmental avenue cannot be used. What combination of inputs will produce the optional descriptor system is subject to debate.

The section of this chapter on "Directions of Change" will address the fourth issue more fully. In short, even with the PIP scheme, there must be some explicit indication of what combination of matching systems and job banks will be most effective in achieving USTES goals. Some will argue that the prescribed course within the PIP will determine this combination automatically. However, as will be pointed out, the control devices applicable to the modular implementation scheme are, in my view, inadequate to determine an optimal combination. If this is in fact the case, it will be of utmost importance to identify as precisely as possible what combination is needed. If, on the other hand, the PIP can control system expansion, an explicit decision would not be required.

Fifth, the enthusiasm of the computerized concepts and their potential contribution to labor market adjustment has diminished significantly in recent months. This condition begins with the local office staff and continues up the bureaucratic hierarchy. Few USTES administrators or staff are as excited about this development now as they were a year or two ago. This may be explained in several ways. First, it is now becoming a part of the daily operation and local office staff have adjusted to it. Second, many now realize that it has not and probably will not change many internal operations so why worry about it. Third, some have lost interest and enthusiasm because many of their expectations have been frustrated. Their expectations may have been too high, but nevertheless they feel genuinely frustrated. Fourth, administrators feel they have done their part by procuring the system, now it is up to the operational staff to make it work. Fifth, as mentioned earlier, client pressure has diminished significantly in the last two years and top level federal, state, and local officials have turned their attention to other matters.

These reasons and undoubtedly several others have accounted for reduced interest and enthusiasm. This is a significant though often overlooked phenomenon. The USTES is on the verge of making a major change in its total operation and even more important a change in public opinion about the agency. If this effort is permitted to gradually melt into the stereotyped mold of traditional USTES activities, this agency will have missed an opportunity to materially change its public image. Therefore, an important internal issue should be the development of a public relations program and mechanisms to stimulate internal interest that will bring this unfinished system back into public view.

The sixth issue concerns the question of in-house versus external usage of data processing expertise. Virtually every public agency would like to have an in-house computer operation with the necessary support staff. There are obvious advantages to this type of arrangement. However, maintenance of a computer facility is extremely expensive. Therefore, an issue that must be resolved (and it apparently must be resolved on an individual agency basis) is whether to train in-house personnel for data processing activity or leave this function for external contractors. If the latter course of action is taken, it presumably will leave agency personnel with greater opportunity for direct service to ES clientele. There may be certain situations that will require in-house expertise, but this decision must be made on an individual situation basis.

Finally, an issue that may not be of direct concern to program developers, but is certainly of interest to all peripheral systems involves the integration of the computerized system with the other agency components. Unemployment insurance, fiscal and management, research and analysis, administration, etc., all become involved in and are a crucial part of any computerized effort. Methods of incorporating them into computerized system are being developed, but to date there are many questions unanswered. Computer usage, report generation and distribution, development and maintenance of the data base, and many other concerns arise in relation to other agency components.

There are undoubtedly other issues that could be mentioned. However, in my view, the above issues are the most important at this point in time. Much effort has been and will continue to be expanded on addressing them in the next two or three years. Resolving or obtaining a concensus on the issues will not be an easy task, but a successful computerized effort will require that most of them be addressed adequately before additional advances can be made.

Directions of Change

Computer-assisted placement in the public sector has existed in some form for more than a decade. There have been numerous changes in basic USTES goals, hardware, operating procedures, etc. The original LINCS system appears very rudimentary in retrospect and we often wonder how the designers and administrators could have been so "naive" as to expect it to work. The

same criticisms are likely to be leveled at us during the next decade.

In any event, a lot has been learned about what will work and what will not. The methods of data input, equipment usage, personnel training, etc., have changed in light of past experience. In general, confidence is high in our ability to handle these types of operations. However, there is still a lot to learn and a number of areas where our understanding and level of knowledge is rudimentary, indeed. Several of these topics will be covered in the next chapter when the "current state of the art" is discussed. At this point it is important to discuss the overall directions computer-assisted placement is taking from the administration policy standpoint.

It is safe to say that little can be said now that will change the general direction of computer-assisted placement. The Manpower Administration has adopted a scheme of implementation that will presumably enable the USTES to expand the basic job bank system into a network of computerized job matching systems of varying degrees of sophistication. The basic plan of action is contained in a document entitled *Phased Implementation Progression for Computer-Assisted Manpower Operations Network* (PIP). It explicitly describes the process by which an elementary job bank is systematically transformed into a matching system using a modular step-test-step-test approach. Conceptually this is a logical and highly rational way to go about it. However, there are some practical problems that may raise questions about the entire process. Before discussing these problems, a brief description of the implementation process is in order.

Without the necessary tools to fully evaluate the existing matching systems, the USTES was compelled to devise some other method of justifying the expansion of the job bank system. In effect, the matching systems had demonstrated the feasibility of job matching but by their very nature were incapable of being rigorously examined and evaluated. They had demonstrated one very important point that became the basis for all system development: job matching was a feasible process. Without this knowledge, the USTES could not have considered expanding the job bank system.

At an early date, it was recognized that the matching systems were in essence a system of relatively independent modules. They

all worked together in the viable system, but each could be considered as an individual entity. Once in the system and intermeshed with each other, it became virtually impossible to determine the precise role each module played and how they affected one another. This was the basis of the evaluation problem of the existing matching systems.

Therefore, it was reasoned that if an elementary job bank was installed and its performance evaluated, it should be possible to append modules to it and test their effectiveness. In this manner, modules could be incorporated into the job bank in a particular city or state until the benefits derived from the addition of one more module equaled the cost of the expansion. At this point, modular expansion would be stopped.

Depending on the matching system considered, there are many basic modules. Some of the most important are:

1) Development of a data base using the various descriptor systems,

2) Attempting to match characteristics of one file with clients representing the other file. For example, the New York AMDS only uses the job order file module and attempts to match in-office applicant characteristics to it,

3) A comprehensive search strategy matching both ways and involving both files,

4) Various types of system output such as video, teletype, etc.

The advantages of this type of progression scheme are several. First, it is a reasonable way of approaching the development process. It provides a conceptually defensible scheme. Second, it is relatively flexible. In other words, it can be expanded or contracted as the labor market conditions dictate. It is also flexible over time in the sense that future conditions may require an expansion or contraction of the system. Third, it only gives an area what it needs to function effectively. Therefore, a lot of needless excess or ineffective capacity will not be tied up in a system.

These are all desirable features of the PIP scheme, but a basic problem immediately arises. Implicit in the overall process is the ability of USTES developers to determine an optimum cost effective point. This requires a determination of not only system costs, but benefits as well. The former is very difficult, the second is virtually impossible with contemporary evaluation techniques. Therefore, what appears conceptually simple is subject to being frustrated in practice. This is a significant problem from the standpoint of efficient resource allocation. However, as a practical matter the progression scheme will proceed as outlined. Attempts will be made to evaluate the modular expansion and informed judgments will be utilized. This is all that can probably be expected under current conditions. However, every effort should be made to devise a more acceptable evaluation technique.

Conclusion

This chapter has accomplished two things: 1) it has identified the critical issues pertaining to computer-assisted placement as a component within the USTES; and 2) it has briefly criticized the direction of change as outlined in the PIP plan. The next chapter will attempt to critique the present state of the art as it pertains to computerized placement. Many advances have been made but there is a long way to go. Subsequent to that development, a series of recommendations will be made in an attempt to provide positive suggestions for needed change.

Chapter V

CURRENT STATE OF THE ARTS

The MIT Conference in 1964 demonstrated several things: first, there was considerable interest in computer-assisted placement in both public and private sectors; second, several systems had achieved token successes, but comprehensive analyses had not occurred; third, an effective means of describing men and jobs had not been devised; fourth, there was unlimited optimism that a full-scale job matching system could and would be developed. Even with this interest and enthusiasm, the expectations implicit in the Conference were not fulfilled. In retrospect, the state of the art was exceedingly primitive. In light of current activities there is some question about how far we have advanced. To be sure, many lessons have been learned about how not to do it, but fewer positive advances have been made in the opposite direction.

It may be useful to summarize several points in both categories. First, in terms of technological capabilities, there is no question about the possibility of constructing a sophisticated computerized job matching system. Conceptually, the problem is relatively straightforward. The hardware required to do the job exists today and in all likelihood has existed for a number of years. Therefore, disregarding cost for the moment, computer technology is not the main impediment to development of a matching system.

Second, it is a well known fact that in most manpower programs, inadequate funding has not been a problem. What this means is that at a point in time there are usually more funds available than can be effectively used. This does not mean, of course, that there are enough resources available to solve all of our manpower problems. Rather, our knowledge of what to do and how to do it places a ceiling on the amount of funds that can effectively be utilized. Much the same problem exists with regard to the matching systems. Every administrator argues that he could do twice what he is currently doing if he had half again as many resources. There may have been occasional problems created because of inadequate funding of these systems, but most will agree that with an untested system, the Manpower Administration was generous indeed. In the last two years, with the rapid installation of job banks there has been a freeze on the level of resources

flowing to the matching systems. However, this is not unreasonable given the fact that they have yet to demonstrate universal effectiveness. Four matching systems exist, but an understanding of what they do and how they do it is incomplete. Even more frustrating is our lack of knowledge regarding how they can, if they can, be adapted to other economic, social, political, and historical situations.

Third, an issue that continually arises in all discussions of man-job matching involves the methods of describing both entities. One thing is certain, DOT coding is not enough, descriptor words are not enough, rating or ranking schemes are inadequate, and a proliferation of selection factors does not do the job. Quite simply, our understanding about what motivates people and what is important in the job environment is incomplete. The factors that make one man attractive to an employer or a job attractive to a man are inadequately understood and are certainly beyond measurement with current techniques. It is doubtful that most employers and employees could explain the factors that persuaded them to make a particular choice. The multitude of subjective factors that influence decision-making and the equally important factors that make for a successful work relationship are beyond current understanding. However, it is these factors that must comprise an effective descriptor system. The systems currently under consideration are relatively devoid of new innovations and follow the traditional patterns. They are derivative of the historical descriptor systems or are based on some notion of motivation theory developed in the context of sociology, psychology, or social-psychology. Occasionally, one of these attempts will show some promise. But, either other unexplained variables affected the positive outcome or the researcher is unable to repeat results under widely varying conditions.

Fourth, a very important discovery relating to these systems involves the reaction of people to automation. Experience seems to indicate that the greatest resistance to computerization is internal and not external. In other words, internal personnel have more difficulty adjusting to a computerized system than do external clients. In fact, applicants and employers seem to expect this type of service and find nothing unusual about it. There was some initial concern that external users would feel alienated by a computerized system, but this has been totally without justification. The probable difference is a psychological one. External

clients see the system as attempting to help them find a job or an employee immediately. If nothing materializes, they can go elsewhere and forget about it. The internal user sees the system as impinging on his work environment. He may or may not see it as a useful tool to be used in providing more effective service. He sees it as a change, a device that forces him to do something different. Change is always difficult and it should not be surprising when there is resistance to it. Also, of course, most external users encounter computers in many of their day-to-day activities and therefore do not find a computerized employment service particularly different.

Fifth, we have learned that it is very easy to become overwhelmed by the computer in terms of its responsiveness to programmed situations. In short, the computer is a device that will do precisely what it is programmed to do, nothing more or nothing less. Without a complete understanding about what is required in labor market adjustments, it has been relatively easy to overreact to particular situations. An example will show what can happen.

In the Utah system a series of tickler notices are generated if certain functions are not performed. Suppose it is February and you are looking for a carpenter's position. Construction has slowed down and there are few carpenter job openings. Therefore, on the five-day, no-service tickler, a notice is generated every five days. It is routed to the appropriate interviewer for review and possible action. The interviewer keeps getting this notice on the same applicant repeatedly. There may be several hundred unemployed carpenters, hundreds of plumbers, masons, pipefitters, etc., thousands of secretaries, and hundreds of farm workers. At particular seasonal lulls, the notice generation system floods the interviewers until the intent of the system is destroyed. The point is that the computer cannot sense the seasonal variation and therefore responds in the usual manner.

With an improved understanding of the labor market it may be possible to program in seasonal variation. However, at present our knowledge does not permit a comprehensive restructuring of the search strategy to accommodate these variations. This is only one example, of one tickler. There are comparable devices in every system that have caused similar problems. We now understand what the problem is even though we don't have the total solution.

This is a step in the right direction however and advances can be expected as our knowledge base expands.

Recommendations

In a previous discussion* this writer set forth a series of recommendations relating to computerized placement. They were the result of research extending over a three-and-one-half year period that involved hundreds of administrators and staff at all levels of the Employment Service. In light of the evidence available at that time, the recommendations are not inappropriate. However, review of some data, further discussions with primarily state-level personnel, and the benefit of less pressured reflection on what has transpired resulted in not a reversal of these recommendations but a more tempered thrust. My first recommendation in the above mentioned study was to immediately cease the expansion of the absolute number of systems and the individual system size. In light of the available evidence, this recommendation may not be grossly out of line. It is difficult to demonstrate that the present course of action is the one that will ultimately lead to the attainment of the Employment Service's long run goals (if and when they are clearly defined). If we cannot show precisely how a system can be utilized in the attainment of goals and objectives (and it is difficult to do when we don't know what the goals and objectives are), it is very difficult to justify vast expansion or for that matter maintenance of the system.

The first recommendation that seems justified in the context of further investigation is that the expansion of individual systems should continue as set forth in the PIP plan but that no new systems should be initiated. This appears to be a departure from rational decision making because of the fundamental problem pointed out earlier. However, it must be realized that the expectations of system staff would be frustrated if "development" or further "advances" do not occur. Also, while an adequate evaluation technique does not exist and probably will not exist for many years, it would be unfair to state that developers know nothing about development and evaluation. Many lessons have been learned and it seems reasonable that informed judgments about

*Willis J. Nordlund, "An Investigation of the Economic Impact of Computer-Assisted Placement Systems," Unpublished Doctoral Dissertation, University of Utah, July 1972.

effective system size can be made. Finally, though it should not be a factor from a purely economic standpoint, the fact remains that a portion (2 percent) of manpower training funds automatically flows to the matching effort each year. These funds could be diverted to some other program, but in all likelihood the effectiveness and efficiency of that program will be equally nebulous.

What the first recommendation attempts to say is that from a purely academic standpoint, the present expansion plan cannot be justified. However, to be pragmatic about the whole matter, we must realize that the state of the art in virtually all manpower activities is relatively primitive. Evaluation techniques are not adequately developed and objectives and goals are often poorly defined. Therefore, if we want the computerized concept to remain viable we must of necessity relax our conditions of survival and permit something other than conceptual perfection. This does not, of course, imply that we should reduce our efforts to develop adequate evaluation techniques. To the contrary, it may be a sound long run strategy to increase substantially the time and resources committed to evaluation. The precise commitment is difficult to identify in the aggregate but individual system administrators should be able to determine what evaluation is being done and how it compares to the total resource commitment.

The second recommendation is derivative from observations made at many points throughout the Employment Service. This agency has a vast cadre of skilled, dedicated individuals that can contribute to the formulation of concrete evaluation concepts and techniques. Much of this expertise lies dormant and will continue to be wasted unless an explicit effort is made to involve it. Therefore, it is recommended that a series of symposia be convened at the state and regional levels to serve as an input media for ideas on conceptual and operational characteristics of computer-assisted placement. It is vitally important that all levels of operational staff be represented in the meetings. In fact, it may be suggested that the initial meetings be comprised exclusively of non-administrative staff. In my opinion, the method of decision-making that has been used thus far is almost as sterile as what would be expected from purely administrative personnel. There has apparently been little input from low level operations personnel that work with these systems every day. These individuals do not have "the whole picture" in mind, but they do know what works and what does not. These individuals make or break the system and it is

absolutely essential that they be permitted to present their views. One of the critical issues was to maintain interest in the systems. This is one method that is likely to be highly successful.

Third, there appears to be considerable confusion or misunderstanding about what the systems can do and what they are supposed to do. The mystic of computerized operations has disappeared from those that work with the system every day and understand what a computer is and what limitations exist. However, there are a surprising number of individuals, primarily in state-level administrative positions, that visualize computerized placement as a panacea to all of their operational problems. Therefore, it is strongly recommended that the USTES provide a complete statement on the current "state of the art" relating to computer-assisted placement systems. This statement must include a clear outline of the current thinking on the subject from the federal level. It must include an extended discussion of the problems relating to these systems and the realistic expectations of their expansion into a national network. This position report would be written in a non-technical manner that will be suitable for consumption on a broad scale.

Fourth, much of the criticism that currently exists and is likely to persist far into the future is derivative from the general lack of information about what the systems are doing. The lack of information is similar to but somewhat more technical in nature than the type of information needed in the preceding recommendation. As briefly pointed out in the first recommendation, the USTES must make a concerted effort to develop an on-going evaluation mechanism that will provide a comprehensive picture of system operations. Fragments of information are circulating within the USTES, external evaluators are analyzing specific aspects of the operation, but there is no coordinated, comprehensive techniques that will show the effectiveness of a particular system at a given point in time. This information is becoming increasingly important and as the funding base of the Employment Service changes it will become even more important.

The fifth recommendation is made with full recognition that some work is being done in this area. More specifically, POSARS (Plan of Service Automatic Reporting System) is attempting to bring the cost accounting system together with the ESARS (Employment Service Automated Reporting System) but preliminary

indications are that it is not working effectively. This should not be surprising. In effect, two systems that are plagued by operational problems have been welded together into a single system. It would be unreasonable to expect a smoothly operating system comprised of two imperfect systems. However, it is a start. At this point, it appears to be the cost accounting system that has the most significant internal problems. ESARS is gradually becoming more accurate as a data system, but several constituent reports are still causing problems.

Therefore, it is recommended that development of the POSARS continue with particular attention given to refinement of the cost accounting system. Unless the cost accounting system can be standardized within and between agencies and programs, its credibility will remain low. It is not suggested that the cost accounting system be reorganized. The Touche, Ross, Bailey, and Smart system developed in 1969-1970 appears adequate as a system, but it breaks down because of improper or inadequate agency usage. Often, programs are developed and the administrative machinery is organized without input from the cost accounting section of the agency. This results in inappropriate classification of programs, personnel, funding sources, disbursements, etc. Only with adequate control over situations of this type can the cost accounting system as a component of POSARS become effective.

Conclusion

It is difficult to objectively evaluate a subsystem of an agency that is influenced by a large number of poorly understood factors. Attempting to understand why a job bank is or is not effective in a particular city requires more than an analysis of the input and output of job bank data. It requires an understanding of how the administrators and staff view the job bank and its relationship to the Employment Service in general. If they see it as a threat to their existence it will probably not work well. If they view it as a cumbersome addition that "creates more work for them" they will probably not utilize it effectively. If, on the other hand, they view it as a tool that can assist them in performing their job more effectively, it may appear to work regardless of other factors. The point is, of course, that attitudes as well as aptitudes are important in system operation.

This overview of computerized placement has not attempted to adequately account for all of the subjective factors impinging on the systems. Rather, it attempted to provide understanding or perspective for those interested in improving the Employment Service operation via computerization. It has, of necessity, been rather general so as to have appeal to a wide spectrum of readers.

There can be no question but that the Employment Service of 1972 is vastly different from the Employment Service of 1968. Similarly, the attitudes toward and understanding of computerized placement has taken on a sense of sophistication in the last couple of years. No longer is it a mysterious device that can only be manipulated by highly skilled technicians. Many still see it as a threat, but now they understand how it operates. It is not a threat because of ignorance, it is a threat because of understanding--understanding that the computer can perform certain functions more efficiently than an interviewer can. Also, understanding that they are no longer in complete control of everything that comes over their desk. The computer monitors some of their activities and does not permit them to overlook certain functions.

What is most important in this context is that agency personnel see the system not as a threat or a necessary evil but as a tool that can be utilized in performing their functions. Some accept this attitude very quickly while others may never fully appreciate the characteristics of their system. Attitude change is a slow process, but in many respects the most important one. Technological advances provide the medium of improvement but it still requires acceptance by internal and external users.

While the directions of change within the Employment Service have been somewhat erratic in the last five years, hopefully a period of relative stability has been achieved. Similarly, the major thrust of computerization prior to 1970 was unclear. Both federal and state administrators had emotional if not empirically based ties to the two basic concepts. Some of this emotionalism still exists, but for the most part it has subsided. The primary reason, of course, was the development of the PIP plan that explicitly outlined the intended direction of computer-assisted placement. The plan itself seems almost as much political as operational. It says on the one hand that job banks are going to be the basis of the national system and that further expansion of the four

matching systems will not occur. On the other hand, it says that the "ultimate" goal is a network of matching systems. Therefore, there is something in it for everyone though some may have to wait a long time to realize their interests.

It is strongly hoped that resource commitment and interest will not diminish in the area of computerized placement. There is much to be gained by maintenance of this system, but these gains are unlikely to be noticed in the short run. There are many problems many of which seem virtually insoluble. However, when the advances that have occurred in the last half decade are viewed objectively, we must admit that we have come a long way. The current lull in interest and activity hopefully will not persist. There is much to be done and the resources exist to do it.